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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/635,011	08/06/2003	Roland Gabriel	265-150	7600

23117 7590 08/29/2005

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EXAMINER	
MULL, FRED H	
ART UNIT	**PAPER NUMBER**
3662	

DATE MAILED: 08/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/635,011	GABRIEL ET AL.	
	Examiner	Art Unit	
	Fred H. Mull	3662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 July 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10 and 12-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *2,9,10,19 and 29* is/are allowed.

6)☒ Claim(s) *1,3-8,12-18,20-28 and 30-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 February 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments on p. 14-15, with regard to various objection(s) and 112 rejections, have been fully considered and are persuasive. These objections and rejections have been withdrawn.

2. Applicant's arguments on p. 15-18, with respect to the rejection(s) of claims 1, 3-8, 14-15, 22, and 32 over Izzat have been fully considered but they are not persuasive.

Applicant argues that Izzat does not discloses "a single radiating element" (p. 16, line 4", nor "only two columns" of elements (4th ¶, line 2). However, neither of this limitations appears in claim 1. All claim 1 requires is "two antenna element systems". No where is an antenna element system defined as "a single radiating element" or "a column of elements". In Fig. 1 of Izzat, the set of antennas that receive signal 7, in this case a single antenna, can be considered one antenna element system. The set of antennas that receive signal 8, in this case two antennas, can be considered a second antenna element system.

3. Applicant's arguments on p. 18-19, with respect to the rejection(s) of claims 1, 23, 27-28, and 32 over Rhodes have been fully considered but they are not persuasive.

As applicant admits, Fig. 2 of Rhodes is similar to Fig. 1 of Izzat, and so the response to Izzat above applies to Rhodes as well. Additionally, Figs. 3 and 4 show 3-by-2 arrays. There is no reason why, when they are physically mounted, as contrasted with being described theoretically, that they cannot be mounted with the side with two

antennas as horizontal and the side with three antennas as vertical, thus giving a two column antenna. There is no requirement for the array to be mounted in a particular orientation, all of the structure is there.

Applicant's arguments on p. 19-20, with respect to the rejection(s) over Shapira have been fully considered and are persuasive.

Drawings

1. The drawings are objected to as indicated in the Notice of Draftperson's Patent Drawing Review provided with the previous Office Action.

Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. If the changes are not accepted by the examiner, the applicant will

be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. Claims 1, 3-8, 14-15, 22, and 31-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Izzat.

In regard to claims 1 and 31-33, Izzat discloses:

only two antenna element systems each having at least one antenna element (set one: 3, set 2: 2 and 4, Fig. 1; see also Figs. 3, 6, etc.); said elements being arranged to be offset with respect to one another, at least in the horizontal direction (they are offset in the horizontal direction), the at least two antenna element systems transmitting and receiving at least in one common polarization plane (¶ 4, ¶ 36, where each of the elements can be used for both reception and transmission), a network, via which the at least two antenna element systems can be supplied with signals with an intensity or amplitude which can be adjusted relative to one another (1); the network having a phase adjusting device (14) connected to receive an input signal (15), said input signal being split into two output signals (12, 13) with the same intensities but with a different phase angles (¶ 22, lines 10-17); and a hybrid circuit (6), via which the output signals are converted to hybrid output signals (7, 8) which are at relatively fixed predetermined phase angles with respect to one another and whose amplitudes differ

from one another as a function of the different phase angles in the phase adjusting device (¶ 23).

In regard to claim 3, the phase adjusting device can be set so the hybrid output signals have the same phase or are shifted through 180 degrees (Fig. 2; ¶ 24, where the phase adjusting device is adjustable continuously (as contrasted to discretely) and passes through the zero relative phase position).

In regard to claim 4, Izzat further discloses an additional phase adjusting element (31, Fig. 3), which varies the phase angle, is provided between at least one output of the hybrid circuit (the lower output) and at least one input of the antenna system (the input to the leftmost antenna).

In regard to claim 5, Izzat further discloses the phase adjusting element comprises a differential phase shifter (¶ 25).

In regard to claim 6, Izzat further discloses the at least two antenna systems have antenna elements which are arranged with a horizontal lateral offset with respect to one another (Figs. 1, 3, and 6).

In regard to claim 7, Izzat further discloses at least two antenna columns, the antenna elements of one antenna system being provided in one column (53, Fig. 6), and the antenna elements of the further antenna system being provided in the other column (54).

In regard to claim 8, Izzat further discloses the hybrid circuit is formed from a 90 degree hybrid (¶ 22).

In regard to claim 14, Izzat further discloses at least two antenna elements are provided and transmit and receive partially in one polarization and partially in a second polarization plane, which is at right angles to the first polarization (¶ 36).

In regard to claim 15, Izzat further discloses dual-polarized antenna elements are aligned at +45 and -45 degrees to the horizontal (¶ 36).

In regard to claim 22, Izzat further discloses that the beam shape is adjusted variably (¶ 36).

providing an antenna system having only first and second columns of antenna arrays (Figs. 3 and 4, where the array is mounted with the two element side in the horizontal direction) where varying an input signal via (i) either a phase adjusting device or a phase shifter adjusting device (71) and (ii) a downstream network (74-78, Fig. 2A), such that the signals at the output of the network are either in phase or are not in phase (depending on the setting of the phase shifter 79, the signals will be either in phase or not in phase, with a 180 degree phase shift where the signals are input into antenna element systems to provide a horizontal radiation.

2. Claims 1, 23-28, and 30-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Rhodes.

In regard to claims 1 and 31-33, Rhodes discloses:

only two antenna element systems each having at least one antenna element (embodiment 1: Fig. 2; embodiment 2: Figs. 3 and 4 where the array is mounted with the two element side in the horizontal direction); said elements being arranged to be

offset with respect to one another, at least in the horizontal direction (they are offset in the horizontal direction),

the two antenna element systems transmitting and receiving at least in one common polarization plane (¶ 87, 99), a network, via which the at least two antenna element systems can be supplied with signals with an intensity or amplitude which can be adjusted relative to one another (¶ 14); the network having a phase adjusting device (71) connected to receive an input signal (72, Fig. 2A), said input signal being split into two output signals (74, 75) with the same intensities but with a different phase angles (¶ 83, lines 3-6); and a hybrid circuit (76), via which the output signals are converted to hybrid output signals (77, 78) which are at relatively fixed predetermined phase angles with respect to one another and whose amplitudes differ from one another as a function of the different phase angles in the phase adjusting device (¶ 83, lines 8-14).

In regard to claims 23, 26, and 30, Rhodes discloses an antenna arrangement:

providing an antenna system having only first and second columns of antenna arrays (Figs. 3 and 4, where the array is mounted with the two element side in the horizontal direction) where varying an input signal via (i) either a phase adjusting device or a phase shifter adjusting device (71) and (ii) a downstream network (74-78, Fig. 2A), such that the signals at the output of the network are either in phase or are not in phase (depending on the setting of the phase shifter 79, the signals will be either in phase or not in phase, with a 180 degree phase shift where the signals are input into antenna element systems to provide a horizontal radiation.

In regard to claims 24-25, Rhodes further discloses:

at least two antenna element systems transmitting and receiving at least in one common polarization plane (¶ 87, 99), a network, via which the at least two antenna element systems can be supplied with signals with an intensity or amplitude which can be adjusted relative to one another (¶ 14); the network having a phase adjusting device (71) connected to receive an input signal (72, Fig. 2A), said input signal being split into two output signals (74, 75) with the same intensities but with a different phase angles (¶ 83, lines 3-6); and a hybrid circuit (76), via which the output signals are converted to hybrid output signals (77, 78) which are at relatively fixed predetermined phase angles with respect to one another and whose amplitudes differ from one another as a function of the different phase angles in the phase adjusting device (¶ 83, lines 8-14).

In regard to claim 27, Rhodes further discloses subjecting the signal which is supplied to the antenna to an additional phase shift, at least upstream of one input (79, Fig. 2A; 8, 9, Fig. 2).

In regard to claim 28, Rhodes further discloses using at least four hybrid circuits via which a four-column antenna array is fed (Fig. 8, where each of 54, 55, and 56 each contain two hybrids (i.e. each contains a device show in Fig. 2A), and thus provide sis hybrids, and 44-47 provide four columns).

Claim Rejections - 35 USC § 103

3. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rhodes in further view of Kraus.

Rhodes discloses his antenna elements may be dipole antennas (¶ 99).

Kraus discloses the use of a reflector with dipole antennas a reflector increases the directivity of the beam (p. 64, Fig. 3-7), eliminates backward radiation from the antenna (p. 347, ¶ 1), and yields a substantial signal gain in the forward direction (p. 347, ¶ 2).

It would have been obvious to include a director in the antenna system of Rhodes in order to allow greater control of antenna directivity and gain.

4. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Izzat in further view of Chadwick.

Izzat discloses his antenna elements may be the antenna elements described in Chadwick (¶ 36).

Chadwick discloses the use of a reflector with his antenna elements (10, Fig. 1; p. 6, 2nd ¶).

It would have been obvious to include the antenna elements in Chadwick as the antenna elements of Izzat based on Izzat's suggestion to do so.

5. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rhodes.

While Rhodes discloses dual polarization antenna elements (¶ 99, lines 1-3), he also explicitly discloses that other radiating elements may be used if appropriate for other applications (¶ 99, lines 3-4). The use of antenna elements with a single polarization is known in the art. It would have been obvious to use these antenna elements where conventional, based on the teaching of Rhodes.

6. Claims 13 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Izzat.

In regard to claim 13, Izzat discloses that his antenna elements "may" be dual polarization antenna elements (¶ 36). Thus, other types of antenna elements may be used. The use of antenna elements with a single polarization is known in the art. It would have been obvious to use these antenna elements where conventional, based on the teaching of Izzat.

In regard to claim 16, Izzat discloses that his invention is applicable to a wide range of wireless communications network protocols or frequency bands, including but not limited to cellular, PCS and UMTS (¶ 38). It is well known that some wireless communication networks operate in a single frequency band. It would have been obvious to use the antenna system of Izzat in known wireless communication networks such as single frequency wireless communication networks.

In regard to claim 17, Izzat discloses that his invention is applicable to a wide range of wireless communications network protocols or frequency bands, including but not limited to cellular, PCS and UMTS (¶ 38). It is well known that some wireless communication networks operate in a multiple frequency bands. It would have been obvious to use the antenna system of Izzat in known wireless communication networks such as multiple frequency wireless communication networks.

7. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Izzat in further view of Fenwick.

Fenwick discloses the connecting lines between the outputs of a hybrid circuit and the inputs of an antenna arrangement can be interchanged to produce different horizontal polar diagrams (col. 6, lines 1-6).

It would have been obvious to include this feature into the invention of Izzat in order to increase the versatility of Izzat's system.

8. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rhodes in further view of Fenwick.

Fenwick discloses the connecting lines between the outputs of a hybrid circuit and the inputs of an antenna arrangement can be interchanged to produce different horizontal polar diagrams (col. 6, lines 1-6).

It would have been obvious to include this feature into the invention of Rhodes in order to increase the versatility of Rhodes' system.

9. Claims 20-21 rejected under 35 U.S.C. 103(a) as being unpatentable over Izzat in further view of Shapira.

In regard to claim 20, Shapira discloses the network has a receiving path and a transmitting path with at least one receiving network and one transmitting network, via which different horizontal polar diagrams are produced for transmitting and receiving (¶ 65, lines 13-15).

It would have been obvious to include this feature into the invention of Izzat in order to increase the versatility of Izzat's system.

In regard to claim 21, Shapira further discloses a receiving amplifier (312, Fig. 3A) in the receive path and a transmitting amplifier (302) in the transmitting path.

10. Claims 20-21 rejected under 35 U.S.C. 103(a) as being unpatentable over Rhodes in further view of Shapira.

In regard to claim 20, Shapira discloses the network has a receiving path and a transmitting path with at least one receiving network and one transmitting network, via which different horizontal polar diagrams are produced for transmitting and receiving (¶ 65, lines 13-15).

It would have been obvious to include this feature into the invention of Rhodes in order to increase the versatility of Rhodes' system.

In regard to claim 21, Shapira further discloses a receiving amplifier (312, Fig. 3A) in the receive path and a transmitting amplifier (302) in the transmitting path.

Allowable Subject Matter

1. Claim(s) 2, 9-10, 19, and 29 is/are allowed.

Conclusion

2. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred H. Mull whose telephone number is 571-272-6975. The examiner can normally be reached on M-F 9:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas H. Tarcza can be reached on 571-272-6979. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Fred H. Mull
Examiner
Art Unit 3662

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Thomas H. Tarcza

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